stR€am 2009

Using Robots to Teach Science,
Technology, Engineering, and Math

Interactive Workshop for K-12 Educators

June 25—26, 2009 at iRobot, Bedford, MA
http://stream.cs.uml.edu
Application Deadline: March 8, 2009

Classroom robotics offers a unique means to provide hands-on activities to motivate interest in STEM subjects. This workshop will provide educators the opportunity to explore how they might use robotics in their own STEM instruction through interactive sessions as well as through presentations by other educators currently using robotics as a way to teach STEM. Representatives of local technology companies will also describe potential careers for students interested in robotics and STEM disciplines.

Featured Robotic Technologies

SCIENCE	TECHNOLOGY	ENGINEERING	MATHEMATICS
iSENSE Data Gatherer	LEGO MINDSTORMS	GEARS Educational Systems	Algebra Immersion Robotics

For additional details on the interactive sessions, please see reverse.

Interested educators should submit the enclosed application form to Phyllis Procter either via email to robots@cs.uml.edu or by fax to 978-934-3551 no later than March 8, 2009. Applicants will be notified by March 15, 2009. The registration fee for the workshop is $50. Optionally, participants may pay an additional $100 fee for an iRobot Create. All fees are due by April 17; refunds available for cancellations before May 22. See website for additional details. Funding assistance for accommodations and substitutes is available. PDPs will be awarded for completing the workshop and follow-up activities.

The STREAM 2009 workshop is organized by the Massachusetts Technology Leadership Council, iRobot, and the University of Massachusetts Lowell.

Interactive Workshop Sessions

SCIENCE

Real World Science Using iSENSE
Fred Martin, University of Massachusetts Lowell, and Sam Christy, Machine Science

iSENSE is a web-based system for aggregating and sharing sensor data collected using ordinary sensor probes used in K-12 classrooms. The system allows high school students and undergraduates to view, graph, analyze, and export data from individual sensors, and to combine data from multiple sensors to examine regional, national, and global phenomena. The system is designed to assist teachers and students in developing science projects with topics ranging from human health to environmental science and energy conservation.
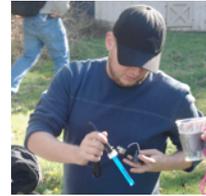
In this workshop, participants will use the iSENSE data collector to gather real-world sensor data, share and visualize it. We will discuss ways to bring these materials and approaches into middle- and high-school classrooms. See isenseproject.org .

TECHNOLOGY

LEGO MINDSTORMS
Melissa Pickering, Tufts Center for Engineering Education and Outreach

This session will involve hands-on LEGO robotics activities to show how basic technology can be used to teach data collection and analysis. The main focus of the session will be the use of direct and remote data collection utilizing various sensors to interpret changes in the surrounding environment. Session participants will have the opportunity to build and program their own LEGO robot to remotely collect data with sensors and compare accuracy between sensors as optimal ways to gather information about the environment. See www.ceeo.tufts.edu .

ENGINEERING

Modeling Systems: An Engineering Advantage
Michael Bastoni, GEARS Educational Systems

Pneumatic systems are fast, powerful and a bit dangerous, and therefore naturally attractive to kids. Many automated   (robotic) systems employ pneumatic components and technologies. Since pneumatics is a particularly effective engineering tool for engaging students in the development and application of STEM knowledge and skills, GEARS Educational Systems includes them in all our GEARS-IDS products. This presentation will include an immersion activity in which participants engineer a pneumatic system through the creation of virtual, mathematical and physical models of a working pneumatic catapult. See www.gearseds.com .

MATHEMATICS

Algebra Immersion Robotics
Ricky Carter and Chris Hancock, Tertl Studios LLC

Robotics is full of algebra: variables, proportions, linear and nonlinear functions, and change over time. In a typical robotics class there is so much else going on that the math may not stand out. The Algebra Immersion Robotics project (AIR) is developing tools and activities to bring the algebra content of robotics to the surface, and to help students in grades 6-9 translate robotics experience into success in school mathematics.

In this session we will try out a couple of Algebra Immersion Robotics activities, using the novice-friendly, mathematically enriched *Minitertl* programming environment. And, since this project is in its early stages, the developers will be seeking participants' comments and ideas about how to make these promising materials work well in a variety of educational settings. See tertl.com .

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